

ABSTRACT

A fuel efficient technique for changing the inclination, with respect to the Earth's equator, for a satellite includes first maneuvering the satellite to the moon on a BCT (Ballistic Capture Transfer). At the moon, the satellite is in the so-called fuzzy boundary or weak stability boundary. A negligibly small maneuver can then bring it back to the Earth on a reverse BCT to the desired Earth inclination. Another maneuver puts it into the new ellipse at the earth. In the case of satellites launched from Vandenberg AFB into LEO in a circular orbit of an altitude of 700 km with an inclination of 34° , approximately 6 km/s is required to change the inclination to 90° . The previous flight time associated with this method was approximately 170 days. A modification of this method also achieves a significant savings and unexpected benefits in energy as measured by Delta-V, where the flight time is also substantially reduced to 88 or even 6 days.